

Claims

- [c1] 1. A method, comprising:
forming a sacrificial layer of material on a substrate;
covering said sacrificial layer of material with a polymer material;
removing said sacrificial layer to form a cantilevered polymer structure over a substrate
using micromachining techniques; and
forming at least one structure between said polymer structure and said substrate which
avoids said polymer structure sticking to said substrate after said removing.
- [c2] 2. A method as in claim 1, wherein said forming at least one structure comprises
forming a plurality of leg portions, extending between an extendin portion of said
cantilevered polymer structure, and said substrate.
- [c3] 3. A method as in claim 2, further comprising an additional etching operation operating
to free said leg portions from said substrate.
- [c4] 4. A method as in claim 3, wherein said additional etching operation comprises a gas
phase etching which removes a portion of said substrate adjacent said leg portions.
- [c5] 5. A method as in claim 3, wherein said additional etching operation comprises etching
using BrF_3 .
- [c6] 6. A method as in claim 1, wherein said forming at least one structure comprises
forming an anti stick layer on said substrate, said anti stick layer formed of a different
material than a material of said substrate.
- [c7] 7. A method as in claim 6, wherein said substrate is formed of silicon, and said anti stick
layer is formed of a material other than silicon.
- [c8] 8. A method as in claim 7, wherein said material other than silicon includes polysilicon.
- [c9] 9. A method as in claim 7, wherein said material other than silicon includes a titanium
material.
- [c10] 10. A method as in claim 6, wherein said anti stick layer is part of a sacrificial layer, and
further comprising removing said sacrificial layer.
- [c11] 11. A method as in claim 10, further comprising a forming a plurality of leg portions,

extending between an extending portion of said cantilevered polymer structure and said substrate.

[c12] 12. A method as in claim 11, further comprising etching away portions of said substrate which abut near said leg portions.

[c13] 13. A method as in claim 1, wherein said polymer material includes Parylene.

[c14] 14. A method as in claim 1, wherein said polymer material is one with a Young's modulus of substantially 4 GPa.

[c15] 15. A method as in claim 1, wherein said cantilevered polymer structure has an unsupported cantilever portion which is greater than 100 microns in length.

[c16] 16. A method, comprising:
obtaining a silicon substrate; and
forming a cantilevered polymer portion over said silicon substrate, and unsupported relative to said silicon substrate; and
preventing said cantilevered polymer portion from sticking to said silicon substrate.

[c17] 17. A method as in claim 16, wherein said preventing comprises forming legs connected to said cantilevered polymer portion, said legs extending towards said silicon substrate.

[c18] 18. A method as in claim 17, wherein said forming legs comprises forming legs which extend to said substrate and may stick to said substrate, and subsequently etching to free said legs from said substrate.

[c19] 19. A method as in claim 16, wherein said etching to free said legs comprises forming removing a portion of said substrate around said legs.

[c20] 20. A method as in claim 19, wherein said etching comprises BrF_3 etching to remove a portion of said substrate around said legs.

[c21] 21. A method as in claim 18, wherein said polymer includes Parylene.

[c22] 22. A method as in claim 16, wherein said preventing comprises forming a layer that prevents said cantilevered portion from sticking to said substrate.

[c23] 23. A method as in claim 22, further comprising removing said layer after preventing

said cantilevered portion from sticking to said substrate.

- [c24] 24. A method as in claim 23, wherein said forming a layer comprises forming a layer of polysilicon.
- [c25] 25. A method as in claim 23, wherein said forming a layer comprises forming a layer of titanium.
- [c26] 26. A structure, comprising:
a silicon substrate; and
a polymer cantilevered element, overlying said silicon substrate, and forming a cavity between a bottom surface of said cantilevered element and said silicon substrate, said polymer cantilevered element having a thickness less than 100 microns, and a length greater than 100 microns.
- [c27] 27. A structure as in claim 26, wherein said cantilevered element further includes at least one leg thereon, which leg extends between said bottom surface of said polymer cantilevered element and said silicon substrate.
- [c28] 28. A structure as in claim 27, wherein said cantilevered element includes at least a plurality of legs thereon, each of which extends between said bottom surface and said silicon substrate.
- [c29] 29. A structure as in claim 27, further comprising an indentation in said substrate in an area of said leg, wherein said leg is separated from said substrate.